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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/355,987	11/18/1999	JOSEPH GIOVANNI BARRESI	T2211-906224	7192

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MILES & STOCKBRIDGE PC
1751 PINNACLE DRIVE
SUITE 500
MCLEAN, VA 22102-3833

EXAMINER	
MORILLO, JANELL COMBS	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
08/03/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/355,987	BARRESI ET AL.	
	Examiner	Art Unit	
	Janelle Morillo	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,7-14 and 18-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,7-14 and 18-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *031709*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 7-14, 18-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over "Aluminum and Aluminum Alloys" p 220, 297, 718-719, 722.

The "Aluminum and Aluminum Alloys" teaches that cast aluminum alloy 356.0 has a composition comprising:

6.5-7.5% Si
0.20-0.45% Mg
0.6% max. Fe
balance aluminum and impurities

(page 718), which substantially overlaps "with sufficient specificity" the composition as presently claimed in claims 1, 4, 5, 15, 20. Additionally, A356.0 overlaps the claimed composition "with sufficient specificity" as well. "Aluminum and Aluminum Alloys" teaches that castings of Al-Si alloy A356 have high strength and high elongation when the dendritic cell size ranges from are low, for instance 22 μm (Fig. 44 page 220), which meets the instant amended DAS limitation (cl. 1, 5, 20, 21). Said Al-Si casting alloy is typically solution heat treated, quenched in hot water (~ 65-100ºC), and aged at 150-230ºC for 2-9 hours (Table 36, page 722), which are substantially the same process steps as presently claimed in claims 12-14, 19. "Aluminum and Aluminum Alloys" p 297 further teaches that solution heat treatment at

540°C for 4-12 hrs is sufficient to provide a T6 peak strength temper for a 356.0 permanent mold cast alloy.

Concerning the presence of iron containing phases β and π (cl. 1-3, 5, 7-10, 16, 17, 20), or the claimed "Quality Index" (cl. 20), the prior art does not teach what phases are present in the final (and intermediate) aluminum alloy or the quality index. However, because "Aluminum and Aluminum Alloys" teaches casting at a solidification rate suitable to produce fine DAS within the instantly claimed range, and the present specification states that "solution treatment at 540°C for 2 or more hours produced desired levels of transformation of β to π phase" (page 8 lines 13-15), which is substantially the same as the solution heat treatment steps of the prior art (wherein the prior art teaches solution heating at 540°C for 4-12 hrs). Because the prior art discloses a substantially identical aluminum alloy processed in substantially the same steps, substantially the same properties (microstructure, quality index) would result as presently claimed.

It is held "Aluminum and Aluminum Alloys" anticipates the presently claimed invention. Alternatively with regard to the process steps, it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See MPEP 2113, *In re Brown* (173 USPQ 685) and *In re Fessman* (180 USPQ 524) *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the

claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292. Applicant has not shown that the product taught by the prior art of "Aluminum and Aluminum Alloys" is materially different than the claimed product by process.

Alternatively, overlapping ranges have been held to be a prima facie case of obviousness, see MPEP *§* 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility. It is held that "Aluminum and Aluminum Alloys" has created a prima facie case of obviousness of the presently claimed invention.

Once a reference teaching product appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence or reasoning tending to show inherency, the burden shifts to the applicant to show an unobvious difference. "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)), see MPEP 2112. In re Schreiber, 128 F.3d 1473, 1478, 44 USPQ2d 1429, 1432 (Fed.Cir.1997). Applicant has not clearly shown an unobvious difference between the instant invention and the prior art's product.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Aluminum and Aluminum Alloys" p 220, 297, 718-719, 722.

"Aluminum and Aluminum Alloys" is discussed in paragraphs above.

Particularly concerning the process steps, said Al-Si casting alloy is typically solution heat treated, quenched in hot water (~ 65-100°C), and aged at 150-230°C for 2-9 hours (Table 36, page 722). "Aluminum and Aluminum Alloys" p 297 further teaches that solution heat treatment at 540°C for 4-12 hrs is sufficient to provide a T6 peak strength temper for a 356.0 permanent mold cast alloy, which touches the boundary of the presently claimed solution heat treatment time maximum of 4 hrs, and therefore meets the instant limitation.

Because "Aluminum and Aluminum Alloys" teaches a substantially identical Al-Si-Mg alloy process by casting with a DAS between the claimed ranges, and heat treating for times and temperatures that fall within the claimed parameters, then substantially the same microstructure (such as transformation of pi phase to the beta phase) is expected to occur. It is held that "Aluminum and Aluminum Alloys" has created a prima facie case of obviousness of the presently claimed invention.

5. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Aluminum and Aluminum Alloys" p 220, 297, 718-719, 722.

"Aluminum and Aluminum Alloys" is discussed in paragraphs above. "Aluminum and Aluminum Alloys" does not specify the matrix has a DAS of between 10 and 20 microns.

However, said limitation is held to be met by ONE dendrite arm spacing being between said range (the instant claims do not refer to an average, mean, etc). At least one cell of the dendrites of "Aluminum and Aluminum Alloys"'s A356-T62 is expected to be within the claim

10-20 μm, because "Aluminum and Aluminum Alloys" teaches a close approximation of 22 μm for the DAS of A356-T62.

Alternatively, "Aluminum and Aluminum Alloys" teaches the relationship between Tensile properties and Dendrite cell size for A356-T62 alloy in Fig. 44 on p 220. In particular, "Aluminum and Aluminum Alloys" teaches DAS (and therefore tensile properties) are controlled exclusively by solidification rate (p 220, 2nd column, "Dendrite Arm Spacing"). Fig. 44 shows samples ranging in solidification rate, representing various casting processes (p 220, 2nd column, "Dendrite Arm Spacing"). It would have been obvious to one of ordinary skill in the art to have solidified at a higher solidification rate, in order to produce the predictable results of smaller dendrite cell size (result effective variable).

Response to Arguments

6. In the response filed on May 13, 2009, applicant amended claims 1, 5, 20, 21, added new claims 22 and 23, and submitted various arguments traversing the rejections of record.

7. Applicant's argument that the present invention is allowable over the prior art of record because applicant has more narrowly defined the DAS, and the prior art at Fig. 44 discloses a wide range of DAS and there is no basis to select the claimed amount from the prior art's teaching has not been found persuasive. On page 220 Fig. 44 of "Aluminum and Aluminum Alloys" shows a trend/ relationship between A356 aluminum alloy's DAS and the expected elongation and strength properties. It would have been obvious to one of ordinary skill in the art to have formed an aluminum alloy with fine average DAS, such as 22 μm, because "Aluminum and Aluminum Alloys" teaches said fine DAS exhibits good strength properties and high elongation. The examiner disagrees that Table 36 and Figure 44 are not consistent/directly

compatible- Table 36 gives typical T6 heat treatment parameters for A356, Fig. 44 states alloys in a T62 (which includes a T6 temper) temper exhibit certain properties.

8. Applicant's argument that the present invention is allowable over the prior art of record because the prior art does not teach solution heating for 2-4 hrs to produce the desired levels of transformation from the pi phase to the beta phase has not been found persuasive. As stated above, "Aluminum and Aluminum Alloys" does teach solution heating for a minimum of 4 hrs, which touches the boundary of the instantly claimed range.

9. Once a prima facie case exists, burden is on applicant to show unexpected results- not on examiner to show that there is none. *In re Mayne* 104 F.3d at 1342, 41 USPQ2d at 1454. Additionally, the prior art's product by process is held to anticipate the instant claims.

Once a reference teaching product appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence or reasoning tending to show inherency, the burden shifts to the applicant to show an unobvious difference. "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products." *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)), see MPEP 2112. Applicant has not clearly shown an unobvious difference between the instant invention and the prior art's product, wherein the prior art is held to anticipate, or in the alternative, create a prima facie case of obviousness, of the presently claimed invention.

10. Applicant's argument that the present invention is allowable over the prior art of record because applicant has shown unexpected results has not clearly been found persuasive. Applicant has not clearly shown specific unexpected results with respect to the prior art of record or criticality of the instant claimed range (wherein said results must be fully commensurate in scope with the instantly claimed ranges, etc. see MPEP 716.02 d). To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. *In re Hill*, 284 F.2d

955, 128 USPQ 197 (CCPA 1960). In the instant case, it is unclear from Fig. 1 that the claimed Al-Si-Mg alloy has unexpectedly improved mechanical properties.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 7:30 am- 4:00 pm Mon-Wed.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/J. M./
Examiner, Art Unit 1793
July 22, 2009